

the absence of lateral thoracic spines compels us to treat it as a member of the *Alcidion* group*.

[To be continued.]

XII.—On the Leaf-Cells of the British Species of *Hymenophyllum*. By GEORGE GULLIVER, F.R.S., Professor of Anatomy and Physiology to the Royal College of Surgeons.

A COMPARATIVE examination of the leaf-cells of this genus seems to be a desideratum, which I can only attempt to supply, at present, as far as regards the British plants.

There is nothing satisfactory on the subject in the works of Sir James Edward Smith and Mr. Sowerby. In the 'English Botany' no mention occurs of the cells; and the figure given of those of *H. Wilsoni* (t. 2686) incorrectly represents the intercellular spaces nearly or quite as large as the cells, though the oval form is truly depicted, but without the slightest indication of any difference in this respect between the two species. The same remark is applicable to the descriptions and plate in the

* The following species also belong to the second section of *Alcidion*:—

A. bicristatum. Elongatum, postice sensim attenuatum, olivaceo-griseum, fusco varium. Caput olivaceum. Antennæ infra parce setosæ, articulo basali angulo inferiore apicali producto, olivaceo-brunneæ, articulis basi pallidis. Thorax dorso obtuse tuberculatus, antice et postice punctatus, olivaceo-griseus, subsericeus. Elytra elongata, depressa, postice sensim attenuata, apice oblique sinuato-truncata, angulis externis productis; lateribus et disco obtuse carinatis; carinis centrobasalibus parum prominentibus, singulis cristis duabus pilorum nigrorum ornatis; elytris utrinque penicillis minutis atris in duplici serie (altera suturali, altera obliqua discoidali) notatis: olivaceo-grisea, tertia parte posteriore saturatiore griseo lineata, marginibus nigro punctatis. Corpus subtus griseum, pedibus olivaceo-griseis nigro punctatis, femoribus basi testaceis. Abdomen feminae segmento ultimo dorsali apice attenuato producto, maris rotundato medio emarginato. Long. 5 lin. ♂ ♀. *Hab.* Rio Janeiro. (Coll. Squires.)

A. trivittatum. Elongatum, depressum, postice sensim attenuatum, brunco-sericeum, vittis et maculis fusco-atris ornatum. Caput fuscum. Antennæ rufescentes, articulis basi pallidis, articulo basali æqualiter clavato. Thorax rotundatus, dorso æqualis, olivaceo-brunneus, sericeus, vittis latis tribus atro-fuscis velutinis (una centrali, alteris lateralibus) marginem anticum hand attingentibus ornatus. Elytra elongata, depressa, apice sinuato-truncata, angulis internis acutis, externis valde productis, humeris parum prominentibus, lateribus utrinque acute flexuoso-carinatis; disco æqualia; carina centrobasali valde prominente, brevi, nuda; rufescenti-brunnea, certo visu carnea nitentia, passim punctata et fusco maculata; lateribus prope basin fuliginosis; disco pone medium plaga atro-fusca antice utrinque linea obliqua grisea marginata ornato. Corpus subtus nigricanti-sericeum. Pedes nigricantes, tibiis et tarsorum articulo primo cano annulatis. Long. 5 lin. *Hab.* Venezuela.

very recent book on British Ferns by Messrs. Sowerby and Johnson. Sir William Jackson Hooker, in his 'Genera Filicum' (1842), in like manner merely gives a figure, by Mr. Bauer, of the cells of the same species, better than that in the 'English Botany,' but still with the intercellular passages too large. Four species of *Hymenophyllum* are figured and described in the 'Century of Ferns' (1854), by the same author; but no information is given about the cells; nor does any appear in the works either of Mr. Francis, Mr. Newman, Professor Babington, or Mr. Bentham. Even the great books of Mr. Moore and Mr. Lowe contain no notice of any variety or difference in these leaf-cells. Hence it might be inferred that they are all alike, or not worth notice in the several species of this interesting genus. But it will presently be shown how probable it is that the form and size of the leaf-cells may afford good distinctive characters, even in the absence of the fruit and of well-grown leaves; and perhaps Sir W. J. Hooker had seen the difference as regards size merely, since of *H. Wilsoni*, in the fourth edition of the 'British Flora,' he remarks, "more rigid and with larger reticulations than the last."

Of these plants Mr. Newman says, "In retaining the two as distinct species I merely bow to the opinion of better botanists than myself;" while in the second edition of 'English Botany' it is stated, "Were not the fructification so remarkably different, *H. Wilsoni* could scarcely be considered a distinct species;" and lastly, Mr. Bentham describes this as a variety merely of *H. Tunbridgense*. But Sir W. J. Hooker, Professor Babington, and other high authorities seem to have no doubt that these plants are really different species; and this view is supported by the observation of Mr. F. Clowes of Windermere, that "all the fronds of *H. Tunbridgense* are annual, while those of *H. Wilsoni* go on growing from year to year."

My own observations, having been confined to two tufts of the plants, are only presented as a suggestion for further comparative examination of their leaf-cells, when, should the difference prove to be regular and constant, it is to be hoped that the shape and size of these cells will in future form part of the descriptive characters of both the British and exotic species.

H. Tunbridgense.—Leaf-cells round, or nearly so, with an average diameter of $\frac{1}{3\frac{1}{7}}$ of an inch.

H. Wilsoni.—Leaf-cells oval, with an average long diameter of $\frac{1}{3\frac{1}{8}}$ and short diameter of $\frac{1}{6\frac{1}{5}}$, the mean of the two diameters being $\frac{1}{4\frac{1}{10}}$ of an inch.

Thus, besides their much larger size, the form of the cells is distinctly oval in *H. Wilsoni*; and the diagnostics of the two

species might be given merely by the terms *sphærenchyma* and *ovenchyma*.

In both species the sides of the cells are somewhat flattened from mutual pressure; and the intercellular passages are either very narrow or not easily seen when the parts are quite moist.

Fig. 1.

Fig. 2.

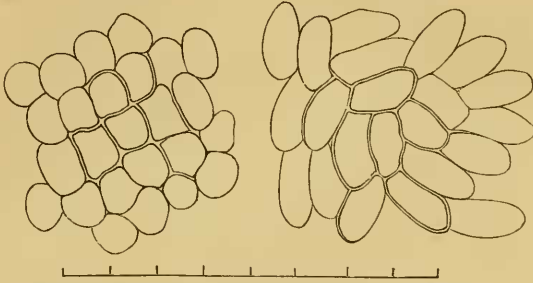


Fig. 1. Outlines of leaf-cells of *H. Tunbridgense*.

Fig. 2. The same of *H. Wilsoni*.

[Both drawn to the one scale of $\frac{1}{500}$ th of an inch.]

Edenbridge, July 9, 1863.

XIII.—On the Value of the *Distinctive Characters in Amœba.*

By G. C. WALLICH, M.D., F.L.S., &c. &c.

IN a series of papers published in the ‘Annals and Magazine of Natural History’ for April, May, and June, 1863, I adverted to the absolute necessity of long-continued and daily observation whensoever it is desired to elucidate the characters and vital phenomena which appertain to the lowest and, at the same time, the most minute forms of organic existence—my remarks on this head having been specially prompted by the truly Protean aspects under which *Amœba villosa* presented itself to my notice.

A fourth month’s close study of that form has not only lent additional force to my previous descriptions, but, whilst it enables me to speak with still greater confidence on the subject, it also demonstrates in a striking degree, as I shall presently show, the fallacy of attempting to arrive at a correct knowledge of the characters and ever-varying phases of such an organism under a less laborious and protracted examination.

After the last paper of my series was completed, namely, on the 20th of May, Mr. Carter called on me; and for the first time I made the acquaintance of a naturalist whose researches amongst the lower forms of animal life have always been justly regarded as well worthy of attention. On a subsequent occasion,